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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,804	11/20/2003	Christel-Loic Tisse	S1022.81060US00	9712
23628 7590 04/17/2007 WOLF GREENFIELD & SACKS, P.C. 600 ATLANTIC AVENUE BOSTON, MA 02210-2206			EXAMINER LIEW, ALEX KOK SOON	
			ART UNIT	PAPER NUMBER
			2624	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/17/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/717,804	<b>Applicant(s)</b> TISSE ET AL.	
	<b>Examiner</b> Alex Liew	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 14-20 is/are rejected.
- 7) ☒ Claim(s) 6-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 6 – 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With regards to claim 6, the examiner cannot find applicable prior art, suggestions and / or motivation teaching dividing the image includes dividing the image into blocks which overlap one another, and a pitch in two directions between two overlapping blocks ranges between one tenth and three quarters of the size of the blocks in combination with all the limitations in claims 1 and 5.

With regards to claim 7, the examiner cannot find applicable prior art, suggestions and / or motivation teaching dividing image into blocks in performed on a sub-sampled image of the digital image and a pitch between two neighboring blocks is dependent on the image sub-sampling ratio in combination with all the limitations in claims 1 and 5.

With regards to claim 8, the examiner cannot find applicable prior art, suggestions and / or motivation approximately locating a pupil in the image is applied to a digital image reduced in size with respect to the original image, the digital image represents the original image with two lateral strips of predetermined width removed in combination with all the limitations in claims 1 and 5.

With regards to claim 9, the examiner cannot find suggestions and / or motivation teaching gradient accumulation operation cumulates a quadratic norm of horizontal and vertical gradients of luminance values of image pixels, the pixels selected at least according to a first maximum luminance threshold of other pixels in the *single* direction in combination with all the limitations of claim 1.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 20 recites the limitation "dividing the image" in line 1. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 – 5 and 14 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US pat no 5,978,494) in view of Choi (IEEE pub titled "New

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Autofocusing Technique using the Frequency selective weighted Median Filter for Cameras”) and Suzuki (US pat no.6,307,954).

With regards to claim 1, Zhang discloses a method for selecting an eye image from a set of digital images based on its definition (see col. 1 lines 43 – 57), the method comprising

- calculating a first approximate characteristic definition score based on the median Hamming distance (see fig 1 – 20),
- selecting a subset of images for which said first score is greater than a predetermined threshold (see fig 1 – 24 – S images are selected from a set of N images, where  $S < N$ ) and
- for each image of the subset of images, calculating a second characteristic definition score by an evaluation method including approximately locating a pupil in the image (the location of the pupil / iris must be known in order to compute the median of Hamming distance) and selecting an image from the subset of images which has the smallest median Hamming distance (see fig 1 – 33).

Zhang teaches calculating the median Hamming distance, but does not teach calculating gradient accumulating, which is based on median calculation (see equation shown in page 10 lines 23 – 31 and page 11 lines 1 – 4, and figure 2 step 6 of the specification), to find the best iris image. Choi discloses using gradient accumulation to determine the best focus image (see equation 15 – final derived equation of the gradient accumulation method and see abstract for finding the best focused image,  $F_x$  and  $F_y$

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are filtering results from horizontal and vertical directions, respectively) and a searching operation to determine the direction of the lens movement, which finds the maximum focus value (Section B: The HCS Operation second paragraph). One skill in the art would include gradient accumulation method to find the best image because to eliminate impulsive noise within the image (see abstract of Choi) to improve image quality for individual identification.

But Zhang and Choi do not show defining an examination window over the iris section of the image. Suzaki discloses approximately locating a pupil in the image (see fig 3 – 2) and defining, from the approximate location of the pupil, an examination window centered on the approximate location (see fig 10 – 302). One skill in the art would include placing a window surrounding the eye image because obtain the correct set of iris pixels to properly analyze the features of the iris / eye to reduce errors in individual identification.

With regards to claim 2, an extension to the rejection of claim 1, Suzaki discloses the examination window has an elongated shape (see fig 10 – 302 – the window is rectangular).

With regards to claims 3 and 4, an extension to the arguments in claim 1, the selection of the window size must include information necessary to obtain a meaningful characteristic score, Hamming distance calculation. If the window size is too small or too large, the calculated definition score will not be accurate.

With regards to claim 5, an extension of the rejection of claim 1, Suzuki discloses method of approximately locating a pupil in the image includes dividing the image into blocks of identical size, the size is chosen according to an expected approximate size of the pupil to be located (see fig 4a – the eye image is divided into equally sized blocks), calculating for each block the average luminance (see col. 5 lines 46 – 49 – the mean density for each block is calculated for the image shown in fig 4a and the resulting image shown in fig 4b) and searching for a block having the smallest luminance, an approximate position of the pupil in the image corresponding to a position of the block having the smallest luminance (see col. 6 lines 34 – 54 –  $S(X,Y)$  at the smallest position will result in the largest value of  $P(X,Y)$ , where the darkest area of the image occurs).

With regards to claim 14, Zhang discloses a method of claim 1, wherein the second score assigned to each image is used to select the clearest image from said set (see fig 1 – 33 – the image with the smallest median Hamming distance is the best image the eye).

With regards to claims 15 and 17, see the rationale and rejection for claim 1.

With regards to claim 16, see the rationale and rejection for claim 2.

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With regards to claims 18 and 19, see the rationale and rejection for claim 5. In addition, the size of each block in Suzuki, shown in figure 4b, is about the size of the pupil.

With regards to claim 20, an extension to arguments of claim 1, Suzuki discloses dividing the image into sections includes dividing the image into overlapping sections (see fig 13C – each of the specular reflection spots are enclosed by a rectangular shape window and they are overlapped with each other).

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Liew whose telephone number is (571)272-8623. The examiner can normally be reached on 9:30AM - 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**Alex Liew**  
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**4/11/07**



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SUPERVISORY PATENT EXAMINER